

AVIATION

The Oldest American Aeronautical Magazine

AUGUST 2, 1926

Issued Weekly

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1916

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XXI

SPECIAL FEATURES

NUMBER
5

THE AMERICAN AIRCRAFT INDUSTRY
A HISTORY OF THE U.S. ARMY AIR CORPS
A HISTORY OF U.S. NAVAL AVIATION

GARDNER PUBLISHING CO., Inc.
HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y.
under Act of March 3, 1879.



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RECENT developments in the aeronautical industry have only emphasized and reinforced the leadership of Vought. The superiority in design, performance, durability and ability consistently exhibited in these proven aircraft have earned the universal preference of pilots and operating personnel, and have created a demand far beyond any heretofore registered in Vought history.



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The Sauzedde Wheel and Brake unit has been designed to meet the problems peculiar to the airplane. By arranging the controls so that each brake can be operated individually or together the pilot is enabled to steer his ship on the ground without the aid of a mechanic. It is the biggest factor in making an airplane a one man air vehicle.

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11. Alloy drum and shoes with cast iron liner
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13. Eliminates mechanic for ground maneuvering.
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15. Reduces ground roll sixty per cent after landing.
16. Increased safety.

The Sauzedde Unit is designed so that it is interchangeable with the present government standard wheels.

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Mount Clemens, Mich.

Sky High Quality

Is The Key Note

of the NEW Airster



Mr. Harry Dyer's Buhl-Verville Wright Whirlwind AIRSTER

The AIRSTER is the plane for one-man operation—one man can start the engine—one man can fold the wings for towing or storage.

SPECIAL FEATURES AND EQUIPMENT OF THE AIRSTER.

Standard Steel Adjustable Pinch All Metal
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Folding Wings

PERFORMANCE WITH WRIGHT WHIRLWIND 200 H.P. ENGINE

High speed with 900 lbs. useful load, 125 m.p.h.
Climbs 10,000 ft. with 900 lbs. useful load, in 13 min.
Ceiling 19,000 ft.
Landing speed 45 m.p.h.
Weight empty 1550 lbs.

WHEELS AND BRAKES—SAUZEDDE. FOLDING WINGS—WRIGHT. PRICE—\$2,500.00.
THE AIRSTER—WRIGHT WHIRLWIND 200 H.P. ENGINE—\$1,125.00.
TOTAL PRICE—\$3,625.00. (Price includes landing gear, baggage, and fuel tank.)

BUHL-VERVILLE AIRCRAFT COMPANY

2930 SCOTTEN AVENUE, DETROIT, MICHIGAN

SEE FOLDER PAGE 47 FOR DISTRIBUTION STORY—SEE FOR IT.

BUHL-VERVILLE AIRCRAFT CO. uses HASKELITE exclusively



THE Buhl-VERVILLE CO. HAS HASKELITE

The uniform quality of HASKELITE has won it a place as a standard on Buhl-Verville aircraft. Among the regular uses in which this material is put on the winged planes are: flooring, wing ribs, strut and web-work, etc.

Now write up the complete order: "We also great pleasure in informing you that we have found HASKELITE satisfactory and economical in every way. We sincerely trust that you will be able to maintain the high standard of quality and workmanship which we have found in your product."

The Buhl-Verville Company readily gave evidence of their complete satisfaction by continuing for a year's use of HASKELITE.

Write for full list of aircraft builders using HASKELITE and the many applications to which it is being put.

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From your experience in development
and production
Types and equipment to suit
all requirements
A cooperative finished product
as your command



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AVIATION

VOL. XXI NO. 5

AUGUST 2, 1926

Published every Monday

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The Wright Cyclone 9 cyl., 427 hp. we cooled radial engine of 1917 on on, with a bore of 4 in. and stroke of 5 1/2 in., developed for the U. S. Navy. Ignition is supplied by two Type AG 9D SCINTILLA Aircraft Magneto.

It is a series of motion pictures showing the construction of the SCINTILLA Magneto and its use in aircraft engines.

AIRCRAFT Engineers and Pilots must upon ignition equipment of the utmost dependability.

BECAUSE SCINTILLA Aircraft Magneto have notably met this requirement they have been adopted for most of the modern American military and commercial engines.

Contractors to the U. S. Army and Navy.

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AND THE DESCRIBED MODEL

The Curtiss "Hawk" Series

FOR PURSUIT TRAINING
WITH THE 180 H.P. WRIGHT MOTOR



FOR PURSUIT FIGHTING
WITH THE 440 H.P. CURTISS D-12 MOTOR

The Curtiss "Hawk" pursuit airplane is now available to the Army Air Service as an advanced training machine, with the 180 H.P. Wright E-2 motor substituted for the regular 440 H.P. Curtiss D-12 motor. Except for this power-plant change, the entire ship is identical with the regular P-1 "Hawk".

This new combination, which is known as the AT-4, has resulted in a machine that is peculiarly well-fitted for advanced training purposes.

ECONOMY: The installation of a 180 H.P. motor, quantities of which are in stock, make possible substantial reductions in initial and operating costs.

SERVICEABILITY: Several years of service development on the "Hawk" series by the Service Personnel and Curtiss Engineers have resulted in a machine that approaches perfection in its care and maintenance.

The AT-4 incorporates all of these improvements and is a type already familiar to the Service.

PERFORMANCE: The AT-4 has a high speed in excess of 120 m.p.h., a ceiling of over 15,000 feet with maneuverability similar to the P-1, acknowledged the most manoeuvrable ship in the world.

But the AT-4 is more than a training plane. The entire power-plant can be detached by the removal of four taper pins, and a regular D-12 power-plant substituted. Thus, in time of emergency, the AT-4 can be instantly converted into a standard P-1 "Hawk", ready to take its place in our first line of national defense.

The Navy advanced training problem can be similarly solved by the use of the 200 H.P. Wright J-5 motor in the Navy type of the "Hawk" airplane.

THE CURTISS AEROPLANE
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AVIATION

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No. 5

Ten Years

ANNIVERSARIES ARE more than an occasion for sentiment. They afford an opportunity to take stock of the work which has been done in the past and that which remains to be done in the future. To AVIATION its Tenth Anniversary also affords an opportunity to thank the many members of the Aviation Industry who have supported it so loyally through hard times and hard. The magazine has, by reason of this support, considered it a privilege to voice the best thought of those in the industry and to be its champion and spokesman in the many crises which have arisen.

It is difficult, in this brief space, to give an adequate account of our indebtedness. In fact which is as true as common sense it is especially essential for the trade to have a medium for the gathering of reliable information and the spreading of the news of the continuous progress which is being made. The value of education does not stop with graduation from school and it has been the constant endeavor of this paper to publish articles and news items in sufficiently interesting form so that more and more people will read them and learn about matters aeronautical. Through descriptions of planes and the products of manufacturers, through technical articles as the theories which underlie flight, through the spreading of news of aeronautical designs both here and abroad, AVIATION has endeavored to hold the air-minded into a deeper sense of unity and to give them a stimulating view of the progress which was being made by others.

The aeronautical editor has a certain sense of perspective which is denied to those who are too closely tied up with the details of actually making an aeronautical machine. He also has time and facilities for the gathering of information which should enable him to lend in the solution of the problems which beset the industry and help fight its battles.

Shortly after the War, AVIATION made a thorough investigation of War need which supplied the trade with valuable figures with which to counteract the accumulation of large expenditures without results. Later, valuable figures were obtained as the Army and Navy approached each other to clarify the situation over before Congress started its investigations. The problems which beset the many features in regard to competitive bidding, maintenance rights and government competition have been discussed at length. AVIATION opened itself as a forum for the discussion of air law and endeavored to arouse an active and intelligent public opinion as the subject Parliament. AVIATION has endeavored to attract and supply information to the private and individual operators who have built up aerial service but who have not the sources of information available to the larger manufacturers.

No one realizes better than ourselves how often we have fallen short of what we have endeavored to do. Lack of funds has been a great handicap and, with the growing prosperity, we will be able to give our readers a better paper. AVIATION deems it an honor to be considered part of the Aviation Industry and hopes it will be able to continue to serve the growing field of aeronautics.

Foundations

AERONAUTICS HAS progressed with momentum rapidly during the last decade but, as many inspectors, the work done can be measured solely as a matter of education and as a foundation for the work still to be done. The years ago, though much material was available, there were practically no trained aeronautical engineers in this country while now there are a large number of technically trained, experienced and competent designers who can produce satisfactory airplanes which will be the equal of any in the World. Factory organizations trained in the building of airplanes are equally essential and, though there was an enormous amount of aircraft building during the War, it is only within the past few years that a manufacturing industry has come which can in any way be called stable and established as firm foundations. In summary matters the congressional laws of this year have laid out a fairly definite and stable program to be followed.

In commercial aeronautics the airplane has become a fast home operator and has created an aerial service business in foundations which seem permanent. Buses, trucks, and even forest guards have gone through the experimental stage. The air mail has done the passenger work for aerial transportation and much has been learned from the operation of the Biennium air lines.

There is, of course, no definite boundary line as such between the work of the last ten years and the work of the future. It would seem as if much of the effort which had gone into aeronautics had been spent in gaining experience and that we now have the knowledge on which to build. Whether this building period will follow along the lines which we, by reason of our past experience, are bound to predict, cannot be predicted. There are, in fact, some who feel that the form of the future plane will not resemble the airplane as we know it today. Whether or not this will be so is immaterial. The important fact is that now the aeronautical field is enjoying a close cooperation between manufacturing and knowledge and such a condition offers the best foundation for the future. The progress of the next ten years may not be as spectacular as that stimulated by the War period but it could seem as if we had crossed the line and changed from an artificial industry based in engineering necessities and had become established on the firm foundations of an industry which fills a needed place in the economic life of a great nation.

you will, as fast as the modern art of transportation advances.

J. G. Vincent,

President, The Society of Experimental Aircraft Men Company
The celebration of the Youth Anniversary of our great organization, Aviation, is a fitting time to pause and evaluate its efforts to the good and better of the new industry.

As its broadest scope for transportation in my mind has the highest status of all methods of transportation and its greatest contribution is the efforts to develop means of transportation in the past, as the history of mankind goes.

On many occasions we will discuss the other means of transportation or simply when there are enough for passengers to large distances passenger carrying and transportation of valuable or perishable forms of resources.

It does not appear at the present that there are any transportation means which are doing as much as the airplane to help others. It is an excellent and efficient means of transportation. We have already abundant proof, available to us in the form of the history of the world.

To discuss not to think of the wonderful air industry as a mechanical structure which we are starting to build is far, far, we have only been working at the foundation and on certain parts of the foundation the surface has barely been reached.

Some twenty-two years ago, the Wright Brothers found out the first step of flight, as it were, in building the foundation for this momentous achievement. Since then, a huge amount of research work has been undertaken and it now respects our foundation are carried down to bed rock. It is other factors we have not touched in far and such research to be accomplished.

Indeed, great engineering developments should be made in an airplane which differs in a striking degree from what we are now pleased to have conventional designs.

Finally, the foundation building is not only as dangerous as it takes but is also quite dangerous, and we should pause in the time to review to those things who have given us their lives in the pioneering efforts of building up this transportation are achieved.

On the climate being desired to be enjoyed by mankind during air transportation upon facilities we have to discuss in detail, but I am sure that these facilities will give us more than will social progress, the appropriate value of all of the present means of transportation just together.

Alexander Klein,

Prof. at East Eng. Dept. Cornell University School of Aeronautics, N.Y.U.

The Youth Anniversary of Aviation has a peculiar and beautiful aspect. It is a time to look at the progress of mankind of being associated with you at its best since of August 1, 1913, as Technical Editor.

The work was in the form of responsibility and of responsibility. I think it is a time to look at the progress of mankind and you should not through any people.

I remember distinctly your instructions to me. The paper was to be about definitely about all things. It was to be about the truth about it. It was to be followed by the consideration of friendship or human policy.

No matter how hard it was at the moment, you always insisted that this paper be followed.

And I have been followed ever since this faithful date of August 1, 1913.

I think that your energy and organization in the conduct of Aviation have been rewarded by a premonition in the field of interest. I believe that Aviation has ever in the course of the most powerful and useful influence in American aeronautics.

It is rather remarkable to think that your return from Europe after a long trip which is unique in our annals should coincide with a period when commercial aviation in the United

States is taking such a rapid and vigorous extension. I am confident that the experience and information you have gained on this trip will enable you to render even greater service in the promotion of American aeronautics, a cause which is so dear to all of us.

Godfrey L. Cabot,

President, National Aeronautics Association of U.S.A.

It gives me much pleasure to write you on the celebration of the Youth Anniversary of Aviation, for far more than I think your publication has, on the whole, during the past years, contributed more to the information of the public on aviation aeronautics than any other one publication.

It seems to me that the great future of our transportation is passenger transportation, both national and international and that persons are being well to go on a time when air transportation is the most important method of passenger transportation. It is a fact that in 1954 there are 100 million persons in the world who are being transported by air. It is a fact that it will ever replace the automobile and the airplane as the most important method of transportation for long and short travel, but I do think that there will be a large and growing increase during the next few years.

Vincent Burnelli,

President, National Aeronautics Association of U.S.A.

On the occasion of the youth anniversary of the establishment of Aviation, I am pleased to extend congratulations and express confidence of its future success.

During the last decade of Aviation, more has been done in the field of aviation progress than in the last century. It is a fact that the aviation industry has its excellent effort and policy to demonstrate increased interest and new developments in the field of aviation.

Aviation's status of aeronautical engineering and its numerous work forms a solid background for you. In the advancement of things over 100,000 miles, which certainly rates you as being the world's most important aviation.

W. A. Yackey, Jr.,

Manager and Chief Pilot, Viking Aircraft Company

I regret that I cannot meet you in person at the docks and greet you upon your return from Europe. I want to wish you a most successful and most enjoyable trip. I want to wish you a most successful and most enjoyable trip. I want to wish you a most successful and most enjoyable trip.

You should be proud of the fact that you have been able to do so much for the aviation industry. You should be proud of the fact that you have been able to do so much for the aviation industry. You should be proud of the fact that you have been able to do so much for the aviation industry.

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have accomplished what you have and would be many years behind your present status.

I want to extend to you our warmest congratulations and our kindest personal regards.

Howard E. Coffin,

President, National Aeronautics Association of U.S.A.

Whether any of the airplanes which may be used against most legislation created by Congress, it is, I am sure, recognized in all that a great stride toward the new horizon, and that a great stride toward the new horizon, and that a great stride toward the new horizon.

It seems to me that we have definitely arrived at a stage where we are now and are now experiencing the progress and the development of the aviation industry. It seems to me that we have definitely arrived at a stage where we are now and are now experiencing the progress and the development of the aviation industry. It seems to me that we have definitely arrived at a stage where we are now and are now experiencing the progress and the development of the aviation industry.

Harrie M. Hanchus,

President, National Aeronautics Association of U.S.A.

It is a pleasure to see you and an activity identified with aeronautical development must be a great satisfaction to you and to the aviation industry, especially as you have accomplished this personally and as you have accomplished this personally and as you have accomplished this personally.

My own connection with aviation is only one year old, although personally I think I have followed the progress in this field of aviation for many years and for many years and for many years.

May it hope that you and Aviation come in for your share of the reward.

Rear Admiral W. A. Moffett,

Chief, Bureau of Aeronautics, U.S.N.

I desire to congratulate your organization, Aviation, on the occasion of the Youth Anniversary of your organization which has been of great value to the progress of aviation.

The aviation industry is a great and growing industry. It is a great and growing industry. It is a great and growing industry. It is a great and growing industry. It is a great and growing industry.

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achievement will be a great contribution to aviation, a necessary step toward its success.

Igor I. Sikorsky,

President, Sikorsky Manufacturing Corporation

It affords me great pleasure to congratulate you and your associates of Aviation on the occasion of the Youth Anniversary at the publication of your memoirs.

When you started your work in connection with the publication of this magazine you undoubtedly had much against you. It was a time when the aviation industry was in its infancy and you were one of the few who were in the field.

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space to report this item, but the development is one of the most interesting in the field of successful engineering research and the Aircraft Development Corporation is now working on the construction of the first model of this type, a 200,000 cu ft. experimental ship for the Navy.

The Aircraft Development Corporation was responsible for the design and construction of the Ford airship, according to reports at Dayton, O., which was completed in 1925 and which is probably the most up-to-date airship now in the world. It is interesting to note that the company is now engaged in making smaller tests of its new design for the Army at Scott Field, Ill. This test is to be 275 ft. high. Furthermore, in addition to the work on the semi-rigid airship, the Aircraft Development Corporation is preparing designs for a new experimental rigid airship for the Army Air Service, on the whole, with a considerable amount of lighter-than-air activity.

Airships Incorporated

One of the closest competitors with the Army and Navy in their respective lighter-than-air programs is the firm of Airships Incorporated, of Hawthorne, N.Y., founded in May, 1928, under the direction of J. Leming Caffery, president, Edwin H. Harnett, vice-president and treasurer, and J. F. Doyle, secretary. In its factory of approximately 25,000 sq. ft. floor space, the company, which employs 40 skilled hands, is very active in the development of lighter-than-air craft for both military and commercial airplanes, in addition to its other activities in both lighter and heavier-than-air work. It will be mentioned that the chief production of Airships Incorporated, have been TC-3 airships, the 30th of the TC-3 airships, all intended for military use, in addition to other and other successes for the Government and the Navy, and also a number of free balloons. The company also produces various balloons, airplanes, and other lighter-than-air craft.

Among its most interesting products is the "Aircraft," a reliable but of reinforced fabric. The use of such a material is of considerable value, in commercial work or for pleasure, but a wide field for its manufacture is based to develop.

Alexander Aircraft Co.

The Alexander Aircraft Co., of Dayton, O., in August, 1935, formed the subsidiary, the Alexander Aircraft Company under the direction of J. D. Alexander, president, D. H. Alexander, vice-president and production manager, E. A. Dumas, secretary-treasurer, and J. A. Williams, sales manager. The company has a large flying field at Englewood, O., and

the Alexander Airport and operates a factory of approximately 35,000 sq. ft. floor space, with 40 employees. To day, the output of the company has been 34 Alexander Eaglehawk planes, a three-engine plane designed around the Cessna OX-5 engine. The production schedule at the moment is at the rate of one plane per week. In addition, an experimental Eaglehawk with a four-engine engine has been produced.

The Eaglehawk is an modified three-engine touring plane with a good performance. An example of its versatility for general touring work is shown by the record flight by Paul C. Varner with a stock model, when he attained an altitude of 17,000 ft. with the OX-5 engine and a full load of gross load, which is sufficient for 5 hours flight.

Atlantic Aircraft Corp.

In December, 1935, the Atlantic Aircraft Corporation of Hightstown, N.J., was formed with the following officers: A. H. G. Folsom, vice-president, H. E. Payne, vice-president, R. C. Starnes, secretary, and H. S. C. Starnes, treasurer. The activities of the company are mainly directed around the development and construction of airplanes, by Folsom designs and in the construction the recent Duke flight of Commander Dyer with the three-engine Folsom V-7 monoplane in a coast-to-coast achievement. This type of plane is fitted with three Wright Whirlwind radial six-cylinder engines at 200 hp.

The company, in its New Jersey factory which covers about 20,000 sq. ft., is now developing a 50 passenger four-engine airliner and is also working on several military projects.

Boeing Airplane Company

The Pacific Aero Products Company, founded in July, 1934, in Seattle, Wash., was primarily organized to undertake the development of some very interesting designs of airplanes which had been produced by W. E. Boeing and a small group at his residence. In April, 1935, the company was changed to the Boeing Airplane Company and development was rapidly carried on in the production of a passenger touring plane powered with the Pratt & Whitney A-34, 300 hp. engine. One of these was purchased by the Navy and soon after into an airline for 50 similar planes was placed, for use at the San Diego Naval Air Station.

These started what has developed into one of the most important factors in the aircraft industry today. Recent products of the Boeing Airplane Company are still being developed. They may be mentioned the Boeing Patrol of 1935 and the Boeing Navy Patrol plane P-14, the large four-engine flying boat equipped with two Packard 300 hp. engines mounted in tandem.



The Ford Varsity three-engine plane (Wright Whirlwind)



The Consolidated PT-1 touring plane (Wright E-2 engine)



The Elco and plane M-1 (Elco report)



The U.S. Army rigid airship TC-3 built by Airships Incorporated



Boeing P-8 Neptune being hoisted by 1950-52 by engine.

Buhl-Verville Aircraft Co.

Aircraft comes into the American Aircraft Industry in the mid-Verville Aircraft Company, which was organized in March, 1935, with Lawrence C. Buhl, president, Alfred V. Verville, vice president, and H. P. Buhl, secretary and general manager. The company, however, in spite of its comparatively recent formation, has already produced one of the best commercial planes in use at the time it was built, and is now, of course, the name of Verville has been known in the commercial field for many years.

The Buhl-Verville Company, which occupies a factory of 100,000 sq. ft. manufacturing floor space and occupies of the present time 25 acres, has, to date, produced two experimental planes and three production machines. The Buhl-Verville design three series, which was originally equipped with the U.S. engine and was fitted with the Wright Wheland engine, has already done a great deal of flying and the company is producing both types in order to get in the range of commercial operations. The machine is very adaptable for both passenger carrying and freight-carrier mail carrying and is based to find its important place in future commercial operations.

Consolidated Aircraft Corp.

The Consolidated Aircraft Corporation of Buffalo, N.Y., was incorporated in May, 1923, with the following officers: H. H. Platt, president and general manager; V. E. Clark, vice-president and chief engineer; George Verne, design engineer; and Thomas Kline, secretary and treasurer. The company came to its most famous, undoubtedly upon incorporation it absorbed the assets of the Buhl-Verville Company (Division of General Motors Corporation) and the Baldwin Company.

During the first year of activities the Consolidated Aircraft Company built 10,000 sq. ft. of factory space, for the Army Air Service. During the Spring of 1933, an experimental training airplane was designed, built and entered into open competition before an official board of officers of the Army Air Service at Brooks Field, San Antonio, Texas. The company was the competitor and, as a result, the Army Air Service has, during the first years 1934-1935 and 1935-1936 ordered the Consolidated P-11 airplane.

After the close of 1936, the Consolidated Aircraft Company developed, built and entered into open competition in the Naval Air Station, Annapolis, B.C., an experimental training plane for the Navy. This machine has the Wright Wheland engine and is convertible from a land type to a

seaplane type. It is also convertible from a light training plane to a primary training type. The company has no competitors and, as a result, orders have been received during the year 1937-1938 for 10 Consolidated P-11 machines. The company has, at present, produced and delivered to date, 175 planes, and employs about 250 mechanics.

Curtiss Aeroplane and Motor Co., Inc.

The Curtiss Aeroplane and Motor Co., Inc., is one of the oldest and best known aircraft corporations in the United States and, incidentally, in the world. Certainly the Curtiss Company is as old as the American Aircraft Industry for it has been in continuous operation manufacturing aircraft and aircraft engines for more than ninety years, during which time it has built up a solid and reputable first-class design and construction.

The original Curtiss Company was incorporated in 1906. At the present time its establishments are maintained, the executive offices and experimental factory being located at Garden City, L. I., N. Y., while the production airplane and engine factories are at Buffalo, N. Y. Furthermore, the company maintains a first-class branch office, Curtiss Field, Niagara, L. I., N. Y. and many other office fields throughout the entire country. The present officers are: C. M. Kern, president; F. B. Howland, vice-president; Leonard Edwards, vice-president; C. E. Kline, vice-president; J. A. B. Smith, secretary and treasurer; T. M. Wright, chief engineer; airplane division; and Arthur K. Smith, engine division.

The Curtiss Aeroplane and Motor Company has always been a forerunner in the development of new and original airplane designs, a fact which has been made possible largely as a result of, not only its inherent wide resources, but because of the adherence to a policy of maintaining the highest possible technical engineering standards as well as precision work in manufacturing and operating bodies. It was because of this that the Curtiss Company was able to give so important a part in the remarkable showing which the American Aircraft Industry put up during the War when called upon to build a tremendous production volume in so short a space of time. During the War the corporation included about 14,000 employees, while even at the present time this figure is as high as 10,000, for the company has expanded Government contracts to build or achieve to a relative amount of commercial production and engineering development work which is constantly going on in the company's own facilities. The manufacturing facilities alone may be judged from the 360,000 sq. ft. of factory floor space. It is interesting here to recall



Catapulting a Vought UO-1 from U. S. West Virginia.

CATAPULT PLANES

The standard catapult airplane equipment of all the Scout Cruisers and Battleships of the U. S. Navy Fleets are Vought UOs.

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The regular aircraft equipment of the U. S. S. "Langley", since commissioning, has been Vought VE-9s and UOs.



"Performance beyond Comparison"



The Curtiss Fisher D-1 observation plane (Curtiss D-12)



The Curtiss Conquest 3B-4 touring plane (The Liberty engine)



The Curtiss Conquest Pigeon mail plane (Liberty)

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that to date the company has produced no less than, at a rough estimate, 6,000 airplanes and 6,000 aircraft engines.

It would be impossible, within the small space available, to recount all the original types of planes which the Curtiss Company has produced, since its expenditures for most of them are well-known to all engaged in the aeronautical field. It may be mentioned, however, that no less than 10 different types have been produced since 1915, and in addition to these there have been many modifications in individual types which do not number in this figure at all. During 1935, the H3C racer was produced, which it will be remembered, was the fastest and fastest made racer at an average speed of 245.09 m.p.h. (194 was recorded) in the former race and 235.57 m.p.h. in the latter, in each case breaking the World closed circuit speed record. The H3C-2, the airplane racer, also set up the new World straightaway, regular speed record at 267.71 m.p.h. In addition, during 1935, were produced the Hawk pursuit plane, P-3 and P-3A and H3C-4 and 5, and the Pelican O-3 observation plane, the original design of which was the Army Observation plane competition of 1924, the A7-4 pursuit training plane, the Carrier Pigeon mail plane and the Lark ground airplane conversion plane.

In engine development and manufacture the Curtiss Company is also a leader, having produced no less than 11 different and semi-old types during the period 1916-1935, of which the OX-5, a 1916 design is still the most common commercial engine in use in the country, and of which the D-12, for example is acknowledged both here and abroad as one of the finest high power engines in existence. Again, mention should be made of the Curtiss road locomotive, popular while in its early days and which was awarded the Collier Trophy in 1925. It is well known that new designs of both water-cooled and air-cooled engines are in process of development, under contract and entirely in connection with the Navy's early selection of its closed, enclosed propeller landing and a similar future.

Detroit Aircraft Engine Works (Syn).

The Detroit Aircraft Engine Works (Syn) is an organization of recent formation created for the purpose of developing and placing upon the market an air-cooled engine of low horse power suitable for commercial operations. The organization is operating under the executive management of Capt. E. W. Birkhead with Glenn D. Apple, chief engineer, and it has produced a very interesting five cylinder engine of 45 hp. Two experimental engines have already been produced and are producing engines. The engine has passed its tests very well and represents a most available commercial power plant.

Eberhart Aeroplane and Motor Co., Inc.

The Eberhart Aeroplane and Motor Co., Inc., of Buffalo, N.Y., formerly known as the Eberhart Steel Products Co.

Inc., was formed in 1915. The officers of the company are: Clarence Eberhart, Jr., president, William Stoddette, secretary and treasurer, Frank W. Duffett, sales manager, Fredrick Fisher, chief engineer, Thomas F. Moroney, project engineer, Norman MacPherson, chief designer, and Bernard J. Brown, factory superintendent. The factory, which covers an area of 185,000 sq. ft., has employed 350 people but the plant is equipped for 500 employees.

To date, the firm has manufactured 77 airplanes, three of an experimental type and the remainder in production. At the present time, it is concentrating on the design of a new type pursuit airplane. The company has also earned an considerable experimental work for the Air Service. It has built hundreds of basic radio, bench engine, superchargers, engine mounts, engine gun synchronizers, etc.

A development of the Eberhart Company that is of major importance is the new type propeller fan, which has very great static power and efficiency. With the material in stock is night flying, the new Eberhart Airways Plane will be even more extensively used.

G. Elins & Bro., Inc.

The company of G. Elins and Bro., Inc., of Buffalo, N.Y., though formed as long ago as 1911, has, since the War, undertaken the construction of airplanes under G. Elins, president. While the company, which operates in such as 30,000 sq. ft. of its factory floor space to aircraft construction, only now plays 40 hands in the aircraft department at the present time, it has produced no less than 20 experimental planes to date, including the M-1 mail plane designed to Post Office specifications, around the Liberty engine. It is particularly interesting to note that Elins and Bro., Inc. has in process of development a commercial plane to fill the needs of light freight carrying by air, a type which will be watched for with great interest.

Goodyear Tire and Rubber Co.

The Goodyear Tire and Rubber Company has, always been an important factor in the aeronautical field. In the years before the War, the company was active in the development of improved behavior and a close contact and activity has been maintained in the lightest of our field ever since. Under the direction of W. C. Young, who is in charge of aeronautical work, the company has produced many non-rigid for the Air Corps.

It must also be recalled that the Goodyear Company has the American rights on the Zeppelin patents and, with the cooperation of the American firm of the Zeppelin Company, the Goodyear Company has already developed the design for very large rigid airships which will probably contribute to the next very distant future.

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Contractors to United States Army and Navy

CONSOLIDATED AIRCRAFT CORPORATION
Buffalo, New York



The Mercury Jr. biplane has met place of the Army Service Corps (Curtiss C-46, 1934)



The Huff Deland Fighter AT-2 (Flight 09410)



Huff Deland training plane AT-1 (Flight E-2, 100 hp)



The Loening Amphibian (Built 1st 1920 mounted 500 hp engines)

THE LOENING AMPHIBIAN

A Patented and Proprietary Design



A wide variety of SERVICE TESTS, have been completed with eminent success, in all climates.

The enlarged and efficient Loening plant is now actually in production, with tools, jigs, and equipment for one airplane a week, soon to be enlarged to two a week.

To the long list of notable, successful achievements of this versatile plane, have recently been added several new World's records.

LOENING AERONAUTICAL ENGINEERING CORPORATION
31st STREET AND EAST RIVER, NEW YORK

Charles Ward Hall, Inc.
In the design and construction of all metal airplanes, the firm of Charles Ward Hall, Inc., as a leader in the American Aircraft Industry. Mr. Hall himself has devoted all his time to a number of years to the problem of metal construction of airplanes and, as a result, he has developed principles which have enabled the application of metal in the field of airplane construction to a degree which has enabled such companies as Charles Ward Hall, Inc., has manufactured a number of all metal airplanes including original designs for the Navy Department and has also been responsible for the construction of some designs for experimental metal construction, suitable for the Navy F-101 single-seater. A very interesting little all metal sport flying boat has also been produced by the Hall Company.

Hess Aircraft Co.
The Hess Aircraft Company, of Detroit, Mich., was organized comparatively recently under the direction of Sydney W. Hess, president; A. T. Hess, vice president; L. E. Jodry, secretary; and C. H. Moore, treasurer. This company is very busy in development work, being engaged in the production of a small plane suitable for amateur and war.

Huff Daland Airplanes, Inc.
In June, 1935, the firm of Huff, Daland and Company was organized and its name was changed within recent months to Huff Daland Airplanes, Inc., with Thomas H. Huff, president; Elliott Daland, vice president; and Sidney Swenson, treasurer. The company's plant at Bristol, Pa., is large, whereas a shop manufacturing since 1926 it has long with a staff of no less than 125 men. It and the company is employing 200 hands, the maximum it has employed at any time. In 1935, Huff Daland Airplanes, Inc., have produced 80 planes of two distinct types. One of the most and most interesting of these, was the Huff-Daland experimental plane with the Curtiss OX-5 engine. This plane is of exceptional interest because of the services of the Huff Daland Design, Inc., a subsidiary company of Huff Daland Airplanes, Inc. This famous company is employing the Huff Daland six-cylinder engine in the Southern States. Future plans extend during planes are operating this year and will cover over 100,000 sq. ft. of space. These planes are powered with Wright radial engines and carry 200 lb. of oil and material. The latter design plane, the Huff model 35, has a Liberty engine and carries 100 lb. of oil and material.

The latest production plane of Huff Daland Airplanes, Inc., is the Tugboat, the Huff Air Service. This light bomber plane is the plane which was the Air Transport Trophy at the 1935 National Air Races with an average speed of 125 m.p.h. and attained a speed of 120 m.p.h. The plane is fitted with the Packard 2000, 200 hp. engine. The company is now engaged in the development of the Packard, the Huff model engine bearing plane for the Huff Air Service.



The Huff model 35 engine airplane plane in development of the Huff model 35, has a Liberty engine and carries 100 lb. of oil and material. The latter design plane, the Huff model 35, has a Liberty engine and carries 100 lb. of oil and material.

Johnson Airplane and Supply Co., Inc.
Founded in September, 1935, with E. A. Johnson, president; E. T. Hertz, secretary; and D. L. Dwyer, treasurer, the Johnson Airplane and Supply Co., Inc., of Dayton, O., has been one of the most active of the post-war companies in the American Aircraft Industry and has been carrying on extensive aerial service work and airplane maintenance in addition to developing some very interesting experimental airplanes. The company maintains a complete machine, a number of 50 cars with all facilities and employs in the month 30, while as many as 50 have been employed by the company at times; in the factory which covers approximately 40,000 sq. ft. and is, therefore, capable of extensive output, the demand arises. One of the most interesting products of the Johnson Airplane and Supply Company, Inc., is the Johnson-Johnson plane which performed so well in both the 1934 and the 1935 National Air Races. It was here by noted also that of the Bantel and the Conroy, two other experimental products which the company has produced, the latter was first place in one of the national speed events in the 1934 National Air Race.

E. M. Laird Airplane Co.
E. M. Laird has been one of the most successful manufacturers of amateur and aircraft since his first commercial operations during the war. When he was located in Wichita, Kansas, E. M. Laird produced the Laird plane which was one of the most successful light aircraft planes at the time. Since then, however, when the E. M. Laird Airplane Company moved to Chicago, Ill., the company has produced several other light aircraft commercial airplanes around the Curtiss OX-5 engine. One of these the Laird Commercial is the most recent. While the original of the Commercial Series was equipped with the OX-5 engine, the plane is now equipped with other the Curtiss C-1 or the Wright Whirlwind engine. It is both the Laird Commercial equipped with the Whirlwind engine that the service as the Chicago Manufacturer, St. Paul, air mail route, maintained by the Charles Debonno, is carried on.

Lincoln Standard Aircraft Co.
The Lincoln Standard Aircraft Company, formed under the War and originally the National Aircraft Company, has been since its formation commercial machine development in the West and Middle West. Under the direction of Ben Page, president of the company, several very interesting experimental planes have been produced, notably the Lincoln Standard Scout plane and the Lincoln Standard L-1, a low-wing, variable pitch plane which is now in extensive commercial use. Recent reports show the company indicate that the development of planes to Vought has just been completed and that both there is a national and recent demand for the L-1.

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The Martin Bomber (See Liberty engine)

Gleason L. Martin Co.

One of the oldest, largest and most successful producers, Gleason L. Martin, appeared the Gleason L. Martin Company in the Archives of 1907, although Mr. Martin and his associates had been engaged in the design and construction of aircraft for the United States since the War during which time many successful airplanes had been produced, culminating in the Martin Bomber produced by the Gleason L. Martin Company in 1935. The first design of the new bomber actually took place on June 17 of that year. The advent of this machine set a landmark in American aircraft production for the Martin Bomber has remained one of the most successful four-engine planes ever produced. In fact, the highest tribute which can be paid to this Liberty engine plane is the fact that its low down moment alone is enough to carry the main axis to which the machine has been applied, for it will be recalled that the Martin Bomber was successfully tested in a long-distance endurance race machine, a day bomber, a night bomber, a high-altitude reconnaissance transport and is a most and rapid machine.

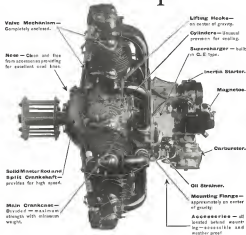


Another Martin product: The Gleason Martin Commercial plane (Weight 2-4,200 lb., engine).

Since the 1910s the Martin Company has engaged in contract work, and in the history, which covers 130,000 sq. ft. of land, having been open, and employs 300 men in airplane construction, the company is very active in meeting its contracts. Since 1912 the Martin organization has produced an average 300 airplanes. It will be recalled in 1935, the company delivered 40 airplane observation machines to the Navy and last year to three-purpose planes due to the Navy, in addition to other orders, and a contract of 125 more planes is being built with.

Judging by the activity in land and the fact that the Martin Company has been doing well, there is every indication of further interesting developments in the future. Last year the company produced and delivered no less than \$2,500,000 worth of airplanes and during the first half of this year, there was no less than \$5,000,000 worth of aircraft under delivery. The production of the Liberty engine is indicative of further activity to come.

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The Curtiss C-35 (Curtiss Super Six 180 hp engine)



The Ryan M-1 monoplane with Super-Sixes 120 hp engine



The DeHavilland D-7 three-engine plane (Curtis OX 3)



RYAN M-1

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OX-5 EQUIPPED

THE MOTOR MOUNT COMPLETE IS DETACHABLE BY FOUR BOLTS, ALLOWING A POWER PLANT RANGE OF FROM NINETY TO TWO HUNDRED HORSE POWER.

WE HAVEN'T FLOWN ALL OF THE AIRPLANES IN THE UNITED STATES, BUT WE ARE SINCERE IN OUR CONVICTION THAT THE RYAN M-1, OX-5 EQUIPPED, HAS AN ALL AROUND PERFORMANCE SUPERIOR TO ANY STOCK MODEL OX-5 JOB ON THE MARKET.

REACHING THE ZENITH OF PERFORMANCE WITH A WRIGHT WHIRLWIND.

RYAN AIRLINES, INC.

San Diego, California

Loening Aeronautical Eng. Corp.

The Loening Aeronautical Engineering Corporation, under the direction of Louis Loening, president, A. P. Loening, vice-president and treasurer, and Robert Letford, secretary, was organized in 1917 and has, since that, produced no less than 25 experimental types of airplanes and airplanes which have met with successful results. The name of Loening, however, has been associated with an airplane from its very earliest days.

The designs produced by the Loening Aeronautical Engineering Corporation have always been practically distributable. Particular mention may be made of the Loening Air Yacht which has been as private as a glove and it will be remembered that it was a Loening Air Yacht which made the flight from Palm Beach, Fla. to New York City on April 13, 1919, leaving the former place at 7:45 a. m. and arriving in New York at 5:00 p. m.

However, undoubtedly the most notable production of the Loening Company is the Amphibia which was produced in 1924. The machine is particularly noteworthy in that it incorporates the so-called Labett engine, a development for which the Loening Company is largely responsible. The machine has since been equipped with the Packard 1500 inverted engine and is thus far the Amphibia is a three seater, able with the Labett engine to fly a two-seater. It should be noted, however, that whenever on this sort of air machine, provided for the observer, one is in the bottom of the hull, in order that he may see and photograph work, the machine should be descended a few inches with Labett or a four-seater with Packard engine.

It will be remembered that Loening Amphibians were used in the MacMillan Arctic expedition in 1925-26 with great success. Furthermore, it will be recalled that the Loening Amphibia has held four World airplane records created in 1925.

An example of future development it is interesting to learn that the Loening Company, whose former plans were intended to fly 10,000 ft. in 10 hours to record the time and to find that they are all this summer working on a four of production at 200 Amphibians per year, supplying 50 loads which opens a very favorable outlook.

Packard Motor Car Co.

The Packard Motor Car Company, of Detroit, Mich., with a World reputation for the manufacture of exclusive automobiles since 1904, turned its attention to the aircraft field during the War, and it is not at all surprising that the company has since been responsible for some of the very finest aircraft engines ever produced. Under the direction of Alvin Mumford, president and general manager, F. G. Turner, vice-president, or charge aeronautical engineering and a number of other notable engineers and inventors, the company has since no less than 500 engines to the manufacture of airplane engines, although during the War, the previous air production was so great that as many as 15,000 were engaged.

The Packard Motor Car Company at the present holds the aircraft engine the Packard 24 1920 and the Packard 24 2500. Both engines are made in three different types, the direct drive, geared, and inverted, although of the inverted type only the 24 1920 has been produced so far. The 24 1920 is a twelve cylinder water cooled engine of 500 h. p., while the 24 2500, also a twelve cylinder water-cooled engine, develops 800 h. p. The company is engaged in large contracts on both types for the Army and Navy.

It will be remembered that the 175-h. p. Dyer built with which Commando Rodgers traveled from San Francisco to Honolulu winter had been equipped with two of the 24 1920 engines and the fact that the journey to the Islands was not completed by air was due to the insufficient supply of gasoline carried and not on trouble with the engines which performed perfectly throughout the flight and, undoubtedly, just as much satisfaction considerably refueling was possible, in spite of the many days exposure to the elements and sea illness of the Dyer built team. It is interesting to note that the Navy has apparently almost standardized on the Packard engines for high power in its large patrol type airplanes.

The Packard Motor Company is continually developing new types and further interesting developments may be expected in the near future.

Pratt & Whitney Aircraft Co.

The Pratt & Whitney Aircraft Co. of Hartford, Conn. is a comparatively new entity since the Aircraft industry being organized on Aug. 2, 1925, although its efforts, F. B. R. Smith, president, George J. Ward, vice-president, George S. Ward, secretary and E. L. Morgan, treasurer and treasurer, are well known in the aeronautical field. The company is a subsidiary of the Pratt and Whitney Company, which was organized in 1900 and which, to date, has made as one of its most expert and substantial contributions, maintenance in the country, producing a great amount of previous work and machinery. Thus, it may be seen that apart from the status of its importance and resources, the Pratt and Whitney Aircraft Co. has a background of experience which is of the very greatest value and importance.

In spite of the comparatively short time during which the company has been in existence it is interesting to note that no less than six experimental engines have been built and the success of the Pratt and Whitney Wing engine is even with them. The total weight of this engine, which is a so-called radial, is 640 lb. with all accessories including the propeller box, and the fact that it develops 425 h. p. at 1800 r.p.m. is indicative of the very excellent design qualities which it incorporates and have well these qualities have been carried out in construction is indicated by the excellent results recently obtained in the 700-h. p. tests of this engine. But here it that radial engines at even higher powers are under development and with a factory that rates of 80,000 sq. ft. it is clear to



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Contractors to U. S. Army & Navy

We are equipped to manufacture and make prompt delivery of airplanes and their accessories and have on hand all tools and fixtures to produce the following parts and assemblies to Air Service Specifications:

- Bolts, Nuts and Clevis Pins of all sizes.
- All stems and parts connected with airplane armament.
- Release and attaching mechanism for landing flaps.
- Night flying equipment complete.
- Ignition shocking equipment.
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- Cowling.

Our new Autoprop Flare, which has already done much to ensure the safety of the night flyer and his cargo, can be safely and speedily attached to any type of airplane.

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The Siksky E-31 (Wright Whiskies)



Curtiss-Martin all-metal eight observation plane (O-5) (Liberty)



The Seafarer and plane with the Curtiss C-6 engine. This machine is now equipped with the Wright Whirlwind engine



The Wright Express (E-6) now under (Wright Whirlwind)

Safe, Sane, Simple, Efficient and Economical Airplanes

Read and decide for yourself who are doing the big things in the development of aviation in the United States!

In U. S. Navy Design Competition for best Ship Board Airplane, March 1921, there were 42 Competitors. G. Elias & Bro., Inc. were awarded 2nd prize of \$10,000.00.

In 6 Army Design Competitions in which the 5 best Designs were awarded prizes, G. Elias & Bro., Inc. were awarded prizes as follows:

Types of Planes

Training	June 1920	\$3000.00
Armored Ground Attack	Nov. 1920	4500.00
Coops Observation	Aug. 1921	5000.00
Two Engine Bomber	May 1922	3500.00
Transport	Mar. 1923	500.00
Four Engine Bomber	April 1923	3500.00

Note different Types have been developed, built and flown by us, all of which were successful.

Airplane Parts

Considerations have also been received for the following parts:

On Fuselages. Information Circular No. 117 issued by U. S. Air Service June 1924:

"First in maximum angle of Twist . . . Therefore this Package (NBS-3 Elias Twin Engine Bomber) is the most rigid of the three in regards to torsion."

Armament

Information Circular No. 481, Air Service, U. S. A. Circular issued for July, August and September 1924:

"An air test was made on one of the new production Type A-3 External Bomb Rack manufactured by G. Elias & Bro., Inc., Buffalo, N. Y. and installed on an MB-3A Pursuit Plane, to observe the action of the Bombs when released during a dive. The test consisted in dropping separately five Mark III (Cooper) fragmentation Bombs. As observed from another airplane, the rack functioned satisfactorily in that all bombs released properly and cleared the airplane structure. An unsuccessful attempt was made to take close motion pictures (multiple speed) of the test."

Propellers

Information Circular No. 484, Air Service, U. S. A. Issued first Quarter 1925:

"Among the problems which have been successfully solved in the construction of this Airship (RS-1 Semi Rigid Dirigible), are the development of large duralumin columns of 100,000 pounds compressive strength, a dual transmission of Liberty Engines, a new type of nose cap, and what are perhaps the largest ever built, Propellers measuring 17 1/2 feet in diameter. These Propellers were built by G. Elias & Bro., Inc."

For Safe, Sane, Simple, Efficient and Economical Airplanes

G. Elias & Bro., Inc.

Aircraft
Department

General Office and Plant
Buffalo, N. Y.

ingapore the 73 airplanes at present engaged in engine development and construction with the company, being considerably ahead of others the demand for engine orders is certain.

Ryan Airlines

Ryan Airlines, for two years operators of commercial flying trails on the West Coast and for orders month operations as far as America's greatest passenger air transportation lines, namely, the Los Angeles San Diego route which has been reported as a commercial proposition on a daily schedule with five aircraft service, have recently entered the field of aircraft manufacturing.

The present plans of the Ryan Airlines call for the immediate expansion of a factory at at least \$1,000,000 of it of four acres, but in the meantime, the great old shop at Southland California is being used as an assembling plant and the factory will deliver ready for use Los Angeles and San Diego for the scheduled route for the testing of new products.

The success of the Ryan M-1 monoplane need not be too hastily assumed as it is apparent that the company is planning to expand its facilities at the scheduled operation of the Los Angeles San Diego route. The new Ryan Ryan Airlines include the short company of the Lockheed H-35 biplane and will produce a plane with a little more speed, a little more safety and a little more economy for daily operations. The result has been the M-1 equipped with the Wright Whirlwind as the Super Ryan engine, with accommodations for two people and baggage.

Since the Ryan M-1 was produced last March, orders for this plane are said to have exceeded ten per cent, and it is for this reason that the proposed expansion of the company is indicated. The new Ryan Ryan Airlines, T. C. Ryan, president, B. F. McKee, treasurer, and J. B. Abner, secretary, having long experience, are fully acquainted with the possibilities at all times with the M-1 monoplane is undoubtedly only the beginning of much to come.

Sikorsky Manufacturing Corp.

The name of Sikorsky is associated with great airplanes from open craft days in Russia, and it is not surprising, therefore, that one of the best planes turned out by the Sikorsky Company under the direction of Igor I. Sikorsky, was a two-engine biplane plane at least as far as the Sikorsky which has been a almost all parts of the modern and modern Western states. One of the company's new recent products, the S-35, fitted with the Wright Whirlwind engine is now being used in research for service such as South America and the Pacific. The Sikorsky plane S-35 will make its appearance shortly.

Swallow Airplane Manufacturing Co.

In February, 1935, the Swallow Airplane Manufacturing Company, of Wichita, Kansas, was formed for the purpose of producing commercial airplanes and more that have been developed what has proved to be one of the very best new aircraft design and construction airplanes produced in the modern. Swallow planes have gone through a period of continual development and the present Ryan Swallow with the Curtiss O-24 engine is in two strokes in throughout the country. The plane is one of those which is recognized as a mark of the "modern craft" which is going on.

Recently, the New Swallow used plane was produced at meeting the standard plane in most respects but being fitted with the Curtiss O-24 engine and having the forward cockpit moved on to form a rear compartment. It is particularly interesting to note that Walter T. Varney, when he had secured the Paul Otter method for the H-35 biplane on the coast, since New Swallow has been equipped with the Wright Whirlwind air-cooled engine. This form is very convenient and reliable construction and there would seem every reason for expecting very soon New Swallow to be established.

The company operates an excellent flying field at about 40 acres provided with a well looking light, at Wichita. The

deco, the Swallow Airplane Manufacturing Company has produced no less than 125 planes, including two experimental engines, and production is now at the rate of 5 to 10 airplanes per month, in the 1935-36. It is expected that the company intends the company is now engaged in it is interesting to note that new designs contemplated by the company include a combination land and passenger plane and a military primary training machine.

Thomas-Morse Aircraft Corp.

As long ago as 1915, in Illinois, N.Y., the Thomas-Morse Aircraft Company was created, together with the Thomas-Morse Aircraft. Since that time the company has been one of the most active contributors to the American Aircraft Industry, becoming the Thomas-Morse Aircraft Corporation in January, 1917. The present officers of the company are: P. L. Morse, president; B. H. Thomas, vice-president; Robert W. H. Morse, secretary, and J. A. Morse, treasurer. During the days before and during the War the company was used as a factory in producing airplanes of a new and varied type to meet with aerial warfare, including engines. The size of the organization was naturally added to the War period when it included something like 1,000 factory workers, but on a part-time basis with a total of approximately 2,000 or so it and employing 40 expert hands capable of rapid expansion when necessary, the Thomas-Morse Aircraft Corporation is maintaining its past reputation to the full.

In looking back over the past production of the company it is impossible not to be impressed with the variety of developments of the plane and trailer type in the early days and high performance low looking results such as the M-1, the S-35 (the standard type) and the M-1, a higher, and is combined a number of others and the various Thomas-Morse planes which have been produced and 100 production machines, together with 4 experimental engines and 150 production engines. The present Thomas-Morse is the official Corps Observation plane in the following model in the extensive past experience.

Travel Air Manufacturing Co., Inc.

Another of those companies which is worth noting is also the manufacturing of the airplane is the Travel Air Manufacturing Company, at Wichita, Kansas. Founded in February, 1915, with C. A. Gross, president, Walter H. Smith, vice-president and general manager, W. H. Smith, secretary, and Lloyd Stinson, treasurer, the company has, during this comparatively short time, developed at all its experimental plane and production machines. The standard Thomas-Morse Travel Air with Curtiss O-24 engine is not only in its class and in all its models in which it has taken, but among the best of its kind in the new type. Another plane produced by the company is the Travel Air Special, a modification of the O-24 plane to take the Curtiss O-24 engine. It will be remembered that the Travel Air Special was the 1915 Airplane of the Year.

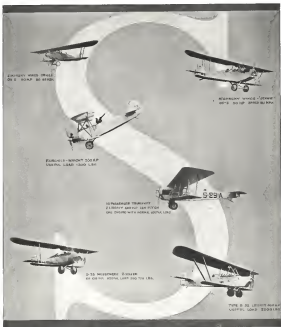
Undoubtedly one of the most active airplane development units at the present time is the new four-engine and pilot machine plane which is also suitable for rapid transportation, owing to the comparatively spacious cabin. This plane is fitted with either the Wright Whirlwind engine or the 150 hp. Hispano-Suiza.

The Travel Air Manufacturing Company maintains a very fine flying field of 500 acres, with 10 hangars and is very well equipped with manufacturing facilities.

Chance Vought Corp.

The Chance Vought Corporation, of Long Beach, N.Y., was incorporated in May, 1912 and is under the direction of George W. Vought president, Robert B. Rowley vice-president, Ray Lewis Vought, secretary-treasurer, Thomas C. Vought, chief engineer, C. E. McFarley, engineering assistant, and E. E. Robert, general manager. While the company is at present in its infancy it should be remembered that the

SIX SIKORSKY SUCCESSES



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The Flying Stearman, the ubiquitous biplane, 1916 to '33, and engine, after prototype in steel plate.



A Boeing O-2 biplane (Warbird) on its catapult or its carrier U.S.S. Memphis.



This Douglas O-2 observation plane of the Air Service in which E. S. Evans and Leslie Wells completed the last lap of their race around the World in the record time of 25 days 15 hr 56 min 5 sec, when they arrived at Mitchell Field, N.Y., on July 14.

BOEING AIRPLANE COMPANY

Manufacturers

of

*Military and Commercial
Aircraft*

Seattle, Washington

Glenn Vought Corporation was the successor of the Lenoir and Vought Corp. which was created during the War.

The Glenn Vought Corporation has been very active since its origin and as in the present time supplying 175 kinds to the history of 45,000 sq. ft. manufacturing space in carrying out its production orders for the Government. The company has produced four experimental planes and 349 production machines, all of which are well known to the general public. It will be remembered that the Vought VE-7 which was produced during and subsequently to the War, was the Air Service competition for standardized training planes and a large number of these machines were delivered to both the Army and the Navy. This same VE-9, which was developed for the Navy as an advanced primary training plane, convertible from land to seaplane type, and which has been used recently in supplying war planes to the marine U.S.S. Langley. But perhaps no Vought production is as well known as the UO-1, the two-seater observation reconnaissance land and seaplane type. This machine is part of the standard equipment of the Navy and, equipped with the Wright Whirlwind engine, is used extensively on the Langley and other ships.

That the Vought Company is maintaining its high reputation as shown by the increasing new designs now being developed. The new UO-3, a training fighter, is now in production for the Navy, while a two-seater observation plane is also being built for the Navy. In the commercial line, the Vought Company is engaged in the design of a multi-engine passenger plane involving many entirely new features and which, it is estimated, is to be manufactured abroad.

Wright Aeronautical Corporation

The Wright Aeronautical Corporation of Patuxent, S. C., which operated in its present form as recently as 1920, is, as is well known, one of the major producers of the American Aircraft Industry, being the direct descendant of the original Wright Company formed by Wilbur and Orville Wright. The company became the Wright Martin Company, which was an active during the War, before it took on its present name. It is now known as the Wright Aeronautical Corporation, under the direction of Richard F. Hoyt, chairman of the board, and consists of the following officers: Charles L. Rossmore, president; Guy Vought, vice-president and general manager; J. P. Paine, secretary and treasurer; E. T. Jones, chief engineer; and G. G. Peterson, assistant to the president.

The Wright Company has long given its major attention to the design and construction of aircraft engines and their engines have for some years supplied a worldwide reputation for excellence of design, construction, and reliability. During the War the Wright Whirlwind engine, of 180, 160, and 150 hp. were most extensively used and it was in this day, while the number of Wright Whirlwind aircraft engines which are being used extensively in this country at the time, more than 100,000, in its power plant of 200 hp. about a considerable. In this connection, it is interesting to note that the Wright Whirlwind engine is being used in six out of the seven turbo motor jet used today in the United States throughout the country. It is hardly necessary to state that the Wright Whirlwind engine is being used in six out of the seven turbo motor jet used today in the United States throughout the country. It is hardly necessary to state that the Wright Whirlwind engine is being used in six out of the seven turbo motor jet used today in the United States throughout the country.

Not in the Wright Whirlwind engine and only in commercial work, for it will be remembered that the engine was

previously designed to meet the particular requirements of the Navy and as such is the most standard for the 200 hp. class.

The Wright Cyclone T-2, 424-500 hp. engine, also of the air-cooled type, is the equivalent to the Whirlwind in that it represents the most up-to-date design in design, construction and in the latest extent in the production of an aircraft engine of the 500 hp. class. At the other end of the power scale is the Wright Whirlwind, of 150 hp. 140 hp. cylinder horizontally opposed air-cooled engine, the smallest engine of its type produced in America.

Going into still higher powers, the Wright Aeronautical Corporation, which covers, in its products, the entire range of aircraft power plant field, produces the Wright Tornado T-3 water-cooled engine of 550-600 hp., which has also met with great success in practice. Covering, therefore, as it does, such a wide field in the production of aircraft engines, it is not surprising that the Wright Aeronautical Corporation, in its large and up-to-date factory at Patuxent encompassing more than 115,000 sq. ft. of manufacturing space, is producing a variety of full power, including 512 export kinds in various gas turbine to various other production. In all, the Wright Aeronautical Corporation has built in less than 1946 engines since incorporation in 1920, while the Wright Company built a total of 5500 engines, making a grand total of 1000 complete engines.

In the manufacture of airplanes, the Wright Aeronautical Corporation has also been active, having produced a number of experimental planes primarily for the purpose of demonstrating its engines. Having made such an outstanding success of the air model engine and being a power in this field, it is not surprising to learn that the experimental engines of the Wright Company are very actively engaged in designing new engines, specializing in the air-cooled type, which have the same power range and serve the increasing demand in both commercial and military fields. It is understood that certain new designs are already completed and production will be started for with the latest interest that new engines are being in the future products of the Wright Aeronautical Corporation.

Woodson Engineering Co.

The Woodson Engineering Company, of Hager, D., which was organized in August, 1935, has in its present officers: C. L. Woodson, president; A. B. Stock, Jr., vice-president; F. H. Brown, sales manager; and G. K. Hood, general manager. The company operates a business of approximately 100,000 sq. ft. of floor space and employs at the present time 25 employees, engaged in the construction and maintenance of airplanes. The company also operates a new production plant at Hager, D., which is the largest of its kind in the country. The Woodson Engineering Company, 3-A, and the Woodson Transport, 3-A, both equipped with the Wright Whirlwind engine, are not only very successful commercial machines, but also have the highest of the speed record in the 1935 Ford Air Mail, in the Woodson Air Express machine.

Yeckley Aircraft Co.

The Yeckley Aircraft Company, for the operations of which W. A. Yeckley, is entirely in-charge, has been extremely active in the aircraft field for a number of years, both in airplane manufacturing and in maintenance and repair services. In fact, in the Yeckley Company is largely due to the results of the early aerial warfare operations which have now developed into what might be called a maintenance and repair service. It will be recalled, of course, that W. A. Yeckley is a former Air Mail pilot of very considerable experience. It is not surprising, therefore, that the Yeckley Aircraft Field, the Yeckley, Indiana, is one of the best organized and equipped commercial fields in the country. The Yeckley Aircraft Company have produced several very interesting planes which are being extensively used and include the Yeckley Sport, the Yeckley Transport, one of which is now being used by the Stirling Exportation in New Guinea, and the Yeckley Cruiser.



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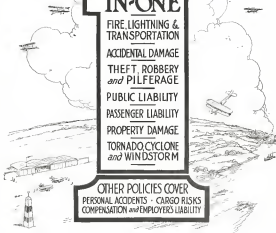
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The Vixen Sport plane (Curtis OX-3)



The Alouette Explorer (Curtis OX-3) three-seater plane



The Pelican Floating (Curtis O-6, 140 hp. engine) three-seater passenger plane

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Ten Years of Civil Aviation

A Review of American Civil Aviation Indicates the Favorable Prospects Ahead.

By EARL D. COBBORN

THE SHUTTLE planes "budding through" could well be applied to the development of aviation in the United States. While Europe has been developing a network of airlines through a system of government subsidies, this country has, until this year, been content with its one or two lines and has allowed commercial aviation to grow up according to its own sweet device. The country alone at all the great nations has had no system of fostering commercial aviation, but, equally important, it has had no law which might curb the national growth. Ten years ago there was practically no aviation flying in this country except that done by a few exhibition fleets. Ten years later we had, besides the air mail line, a well established industry based on "Aerial Service" and a group of airlines which in the neighborhood of 10,000,000 miles per year. As shown by the figures brought out in *Airways*, on the occasion of flying date in this country during 1938, we have more civilian planes and pilots and fly so many times than in any other country. The development of "Aerial Service" is such an extent a target to this country and the cause of the growth deserves to be studied.

Cause of Growth

In regarding the growth of civil aviation in the United States with this in Europe it must be remembered that, taken as a whole, the individual in this country is more much wealthier than the citizen of Europe. Not only could the purchase of planes by individuals be easily financed but passengers had the money to pay for air fares and companies had the money to pay for advertising and for the aerial photo. Money, however, is not the only factor in the growth of American civil aviation. The blood of the power-drill fighter in our veins and the adventure and thrill of flying through *Airways* were the first of these. Thereafter, this is shown most definitely by the large proportion of Americans who patronize the European air lines and, furthermore, as people throughout the West, the proportion of the population which has flown is much greater than in any foreign country. Americans are great travelers and they take to the airplane, and so they have taken to the automobile.

The great first step by the Mississippi Valley (now in the United States), and, on numerous landings, where numerous planes and automobiles landed, was the first in which the law in various countries. The climate even of the Eastern States is better far than that of most of Europe while in California perfect weather prevails at all

times. Therefore, the great demand and the easy climate, where no developed transportation system exists, should have been a great stimulus to the growth of aviation. In nature of fact, however, this factor has not been very pronounced. The proportion of revenue derived by "Aerial Service" companies from long cross country flights carrying passengers is comparatively small.

War Surplus Equipment

Following the War, the Army had vast quantities of surplus material which they sold to civilians in general which ran from ten to twenty per cent of the original cost. As compared to modern equipment this material was inefficient from an operative point of view and from the maintenance viewpoint it was obsolete and dangerous. What would have happened if this vast amount of material had been destroyed as a precautionary but no release has certainly been the chief factor retarding the growth of flying in this country. For a long time it looked as if this cheap equipment would completely stifle the growth of any manufacturing of civilian planes in this country.

Using this inefficient equipment put very definite limits on what could be done for the future in this country and it is amazing that they could have in such money with such planes. One of the large number of war treated planes which bought the cheap planes, a small proportion found them to operate and maintain planes and developed entire trade of business which were actually profitable. These few successful operators realized that more efficient equipment was necessary and represented with all sorts of makeshift planes which would be a little better than the surplus war surplus. A few went further and steadily designed and built new planes which would meet the requirements of the business which had been built up on the surplus material. Growth at first was slow, but, with the aid in price of the war surplus planes the determination of their quality and the endorsement of the greater efficiency of modern equipment, a boom came and there was a very considerable development during this country entirely to embrace work and produce a considerable number of planes. Statistics indicate that more planes will be built in 1939 for civilian and commercial use than for either the Army or the Navy, though, of course, the most value will not be so great. The larger number of these planes are powered with Curtiss OX engines and there is no doubt that this choice and reliable power plant has a most valuable asset in American aviation.



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THE GIBBONS LANDING AND LAUNCHING DEVICE CAN BE USED ON Buildings, Battleships, Ocean Liners, Public Buildings, Post Offices, Municipal Stations, Hospitals, Theatres, Isolated Places and Rocky Mountains.

The device will take only two men to handle and it will set and weigh more than a 100 ton.

Any building can use our landing and launching device at one time, and can load or launch two planes at the same time.

The present airplane carrier can load or launch only one plane at a time.

Our device will make any ship or area carrier.

The two battleships which a foreign Government is now building will be equipped to take one or more, which means to replace the airplane in flying upon modern ships and ships.

The U.S.N. ocean liner requires 15 planes and 250 men to get them up and out one one-half million dollars in a plane and crew.

Our device can load one or two landing and launching devices of any type to land and launch planes.

Admiral W. A. Fisher, on November 10, 1920, wrote the following article: "I have the receipt of plans for the German Steamers to know the ship when we land with engines, fuel and provisions, saving a day or two. Landing devices on great ocean carriers are perfectly feasible."

We close of the airplane carrier in a divided whole among the best when it comes when they? But it says they of the first one have one to four landing and launching devices the will make any ship in any carrier and not interfere with the use of it has been subjected to thorough and extensive research work.

As to the associated losses of a large government for the period of eight months and has been to be very efficient in every detail.

Through the associated patents and associated deposit may of a well known U.S. company in charge of this problem of aviation when a great lot of our needs in the world, it proved that it can do what is called "Gibbons" in landing and launching a great crew.

The device is the most of various study and representation since 1929 by an article Mr. D. J. Gibbons, named by a staff of all aircraft, mechanical, commercial and structural engineers.

The efficiency of this device has been demonstrated by its production of accidents, due by total associated in planes and ships (not in any employment) who have seen the working of our device. This device is so easy that any man can use it at the greatest point in developing commercial aviation.

The associated landing gear, in structural landing facilities and storage will be in the area (where a ship) large for the storage of planes on both the same in our old groups have now in accordance with our device from such and such.

After the device in the United States in Sept. 15, 1935, and "The first in the future will come the new city on building designed to one single houses, with a landing dock. The associated water problem can be solved from the roof below it is called in the event."

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Automotive Abstracts of June 20th, 1926, in its department "Automotives", abstracts 27 items from 11 American and foreign aircraft and automotive publications. Of these 27 abstracts, AVIATION is represented by 12. Four other American aeronautical publications are represented by a total of 5 abstracts.

The publications quoted and the number of items from each are given below.

AVIATION	12
Aero Digest	2
U. S. Air Service	1
Spiverson	1
National Aeronautic Assn. Review	1
Journal of the Society of Automotive Engineers	2
Mechanical Engineer	1
The Aeronautist (England)	1
Flight (England)	2
Flugwesen (Germany)	2
Zeitschrift (Germany)	2

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